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2007 IEPR Workshop on Scenario Analysis

Aging Plant Retirements

August 16th, 2007

Executive Summary

- The CEC's has made a good start toward the assessment of retiring the aging fossil fuel plants in SCE's service territory
- SCE agrees that more study is needed before any formal plans can be made
- The future analysis plans should include
  - An analysis which accounts for
    - Import Capability
    - Intertie outages and
    - NERC/WECC reliability standards
  - Different system build out scenarios with the assessment of:
    - Emissions effects
    - Water and fuel usage
    - Various possible renewable and other generation siting needs
- CAISO is coordinating a collaborative study with the IOUs, the CEC, and the State Water Resources Control Board

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The CEC is investigating the retirement of 4,140 MW of aging fossil fuel plants in SCE's western LA Basin

- SCE applauds the CEC for its considerable efforts in performing this study
  - It is a reasonable electrical simulation of the SCE power grid
- SCE agrees with the report in it's conclusion that further analysis is needed before implementation of the recommendations is considered
  - We don't necessarily agree with the specific retirement conclusions
  - We believe future upgrades will be more extensive and costly than proposed
- SCE would like to discuss its view of the current recommendations, this analysis, and any future analysis

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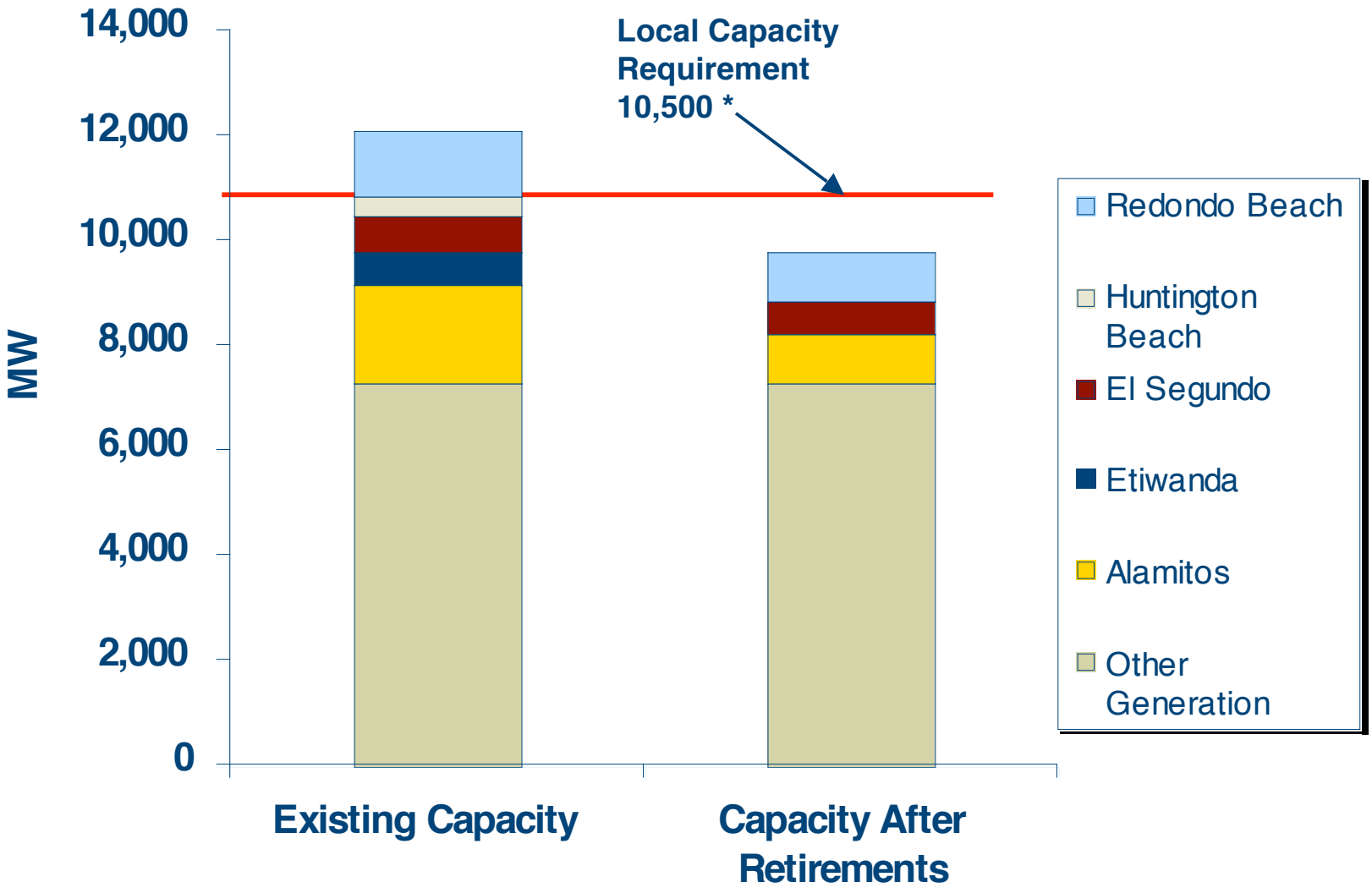
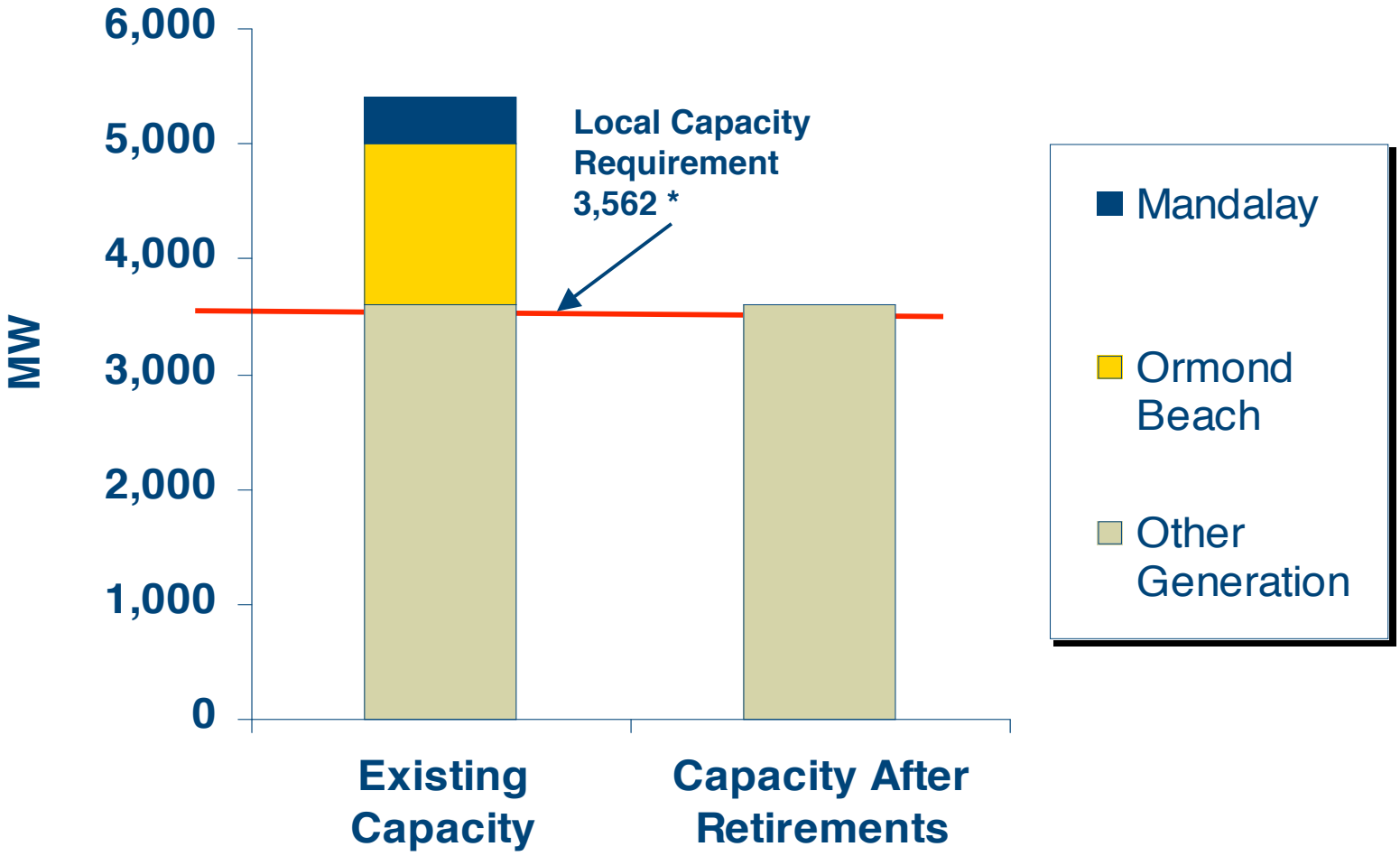
If the plants are retired by 2012 as proposed, there may not be enough capacity in the LA Basin to meet the local capacity requirement (LCR)



* CAISO 2008 Local Capacity Technical Analysis Report and Study Results, 3/9/07

If the plants are retired by 2012 as proposed, any future increase in the LCR for the Big-Creek Ventura area may exceed available capacity



* CAISO 2008 Local Capacity Technical Analysis Report and Study Results, 3/9/07

Before proceeding with the recommended plant retirement several issues should be addressed

- Bringing new baseload generation into the LA Basin before 2012 is highly problematic because of a lack of available emission offsets
  - Siting and licensing will require permits from SCAQMD
- Cost allocation to benefiting customers must be addressed
  - In order to fund any new capacity and/or transmission upgrades, a mechanism must be developed for the costs to be allocated across all customers that benefit from the upgrade - not just SCE ratepayers

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The CAISO is the right entity to coordinate the next study

- The CAISO is coordinating a study entitled “Old Thermal Generation Retirement and Replacement of Once-Thru Cooling Long-Term Transmission Planning Study” planned for completion in 4th qtr 2008
- This study includes stakeholder groups such as the CEC and the California State Water Resources Control Board as well as the IOUs
- The current plan proposes:
  - All appropriate analyses for system reliability
  - An iterative process (screening and detailed analysis of selected parameters)
  - Plausible scenarios
- The goals of the plan are:
  - To collaborate with all stakeholders
  - Allow each IOU to plan the changes to its own system
  - An actionable plant retirement plan

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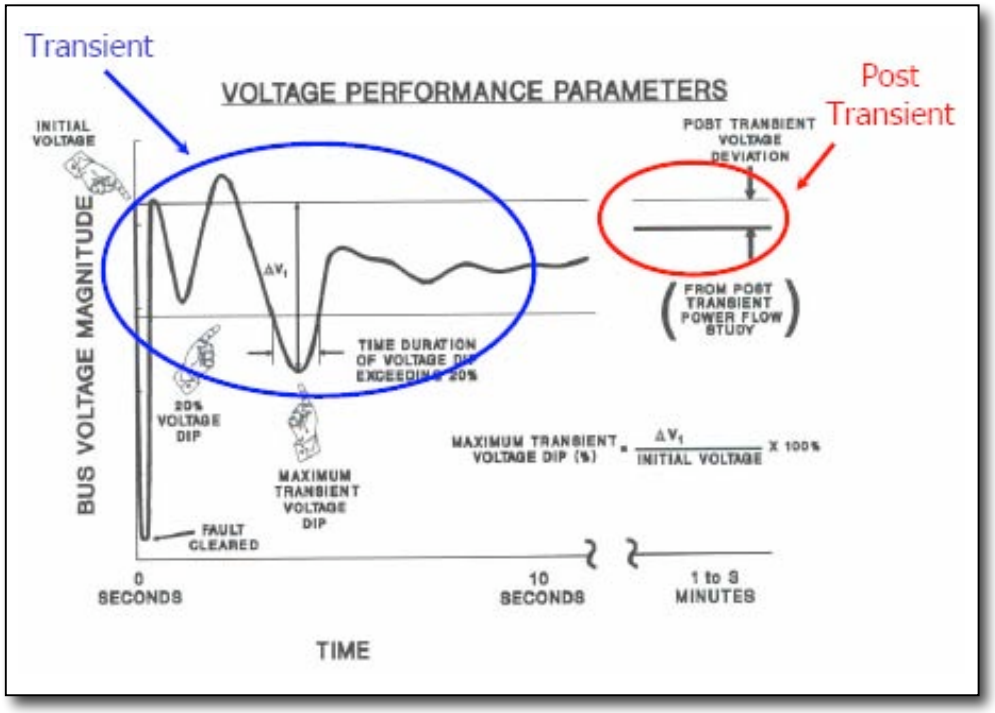
Back up slides

Additional analysis is needed to assess system reliability impacts. The CEC study considered load flow analysis only

Future analysis should incorporate:

- **NERC/WECC reliability standards**
- **A voltage stability analysis following a major disturbance**
  - Voltage Stability refers to the ability of a power system to maintain steady voltage at all buses in the system after being subjected to a disturbance
- **A transient stability analysis to assess system performance during critical disturbances**
  - Two Types of Dynamic Stability
    - Transient Stability
      - Synchronization of Generation with Load
    - Post-Transient Stability (Var Margin)
      - Voltage Decline and Collapse
    - Both cause Blackouts
    - Most collapses are caused by either voltage instability, angular instability or both



Any transmission system analysis should account for intertie outages and southern California existing import capability limits as listed below

Import/Export and Path Assumptions from (CAISO Stakeholder Group Study*)

NOTE - Replacing western generation with eastern generation as recommended by the CEC report, affects the rotating inertia in the LA Basin, impacting import capability

Path Number	Transfer Path	Path Rating (MW)
15	Midway - Los Banos	3265 MW N/S 5400 MW S/N
17	Borah West	2557 MW
24	PG&E - Sierra	160 MW W/E 150 MW E/W
25	PacifiCorp/PG&E 115 kV Interconnection	100 MW (winter) N/S, 80 MW (summer) N/S; 45 MW S/N
26	Northern-Southern California	3400 MW N/S 3000 MW S/N
27	Intermountain Power Project DC Line	1920 MW NE/SW 1400 MW SW/NE
41	Sylmar to SCE	1600 MW Bi-directional
42	IID - SCE	600 MW E/W
43	North of San Onofre	2440 MW S/N
44	South of San Onofre	2200/2500 MW N/S
45	SDG&E - CFE	408 MW N/S 800 MW S/N
46	West of Colorado River (WOR)	10,118 MW E/W
49	East of the Colorado River	7550MW E/W
60	Inyo - Control 115 kV Tie	56 MW Bi-directional
61	Lugo - Victorville 500 kV	2400 MW N/S; 900 MW S/N
65	Pacific DC Intertie (PDCI)	3100 MW Bi-directional
66	COI	4800MW N/S; 3675 MW S/N
	SCIT	13,700 MW 14,500 MW after 6/2004.

* Old Thermal Generation Retirement and Replacement of Once-Thru Cooling Long-Term Transmission Planning Study Plan Version 1.0 August 1, 2007